

and the statement “[Reserved]. For guidance see § 86.1817-05.”

(a) through (o) [Reserved]. For guidance see § 86.1817-05.

(p) The following provisions apply for model year 2008 and later engines. These provisions apply instead of the provisions of paragraphs § 86.1817-05 (a) through (o) to the extent that they are in conflict.

(1) Manufacturers of Otto-cycle vehicles may participate in an NMHC averaging, banking and trading program to show compliance with the standards specified in § 86.1806-08. The generation and use of NMHC credits are subject to the same provisions in paragraphs § 86.1817-05 (a) through (o) that apply for NO_x credits, except as otherwise specified in this section.

(2) NO_x or NMHC (or NO_x plus NMHC) credits may be exchanged between heavy-duty Otto-cycle test groups certified to the engine standards of subpart A of this part and heavy-duty Otto-cycle test groups certified to the chassis standards of this subpart, subject to an 0.8 discount factor (e.g., 100 grams of NO_x credits generated from vehicles would be equivalent to 80 grams of NO_x credits if they are used in the engine program of subpart A of this part, and vice versa). Credits that were previously discounted when they were banked according to § 86.1817-05(c), are subject to an additional discount factor of 0.888 instead of the 0.8 discount factor otherwise required by this paragraph (p)(2). This results in a total discount of 0.8 ($0.9 \times 0.888 = 0.8$).

(3) Credits are to be rounded to the nearest one-hundredth of a Megagram.

(4) To calculate credits relative to the NO_x standards listed in § 86.1816-08 (a)(1)(iv)(A) or (a)(2)(iv)(A) (0.2 or 0.4 grams per mile, respectively) express the standard and FEL to the nearest one-hundredth of a gram per mile prior to calculating the credits. Thus, either 0.20 or 0.40 should be used as the value for “Std”.

(5) Credits generated for 2008 and later model year test groups are not discounted (except as specified in § 86.1817-05(c) and paragraph (p)(2) of this section), and do not expire.

(6) For the purpose of using or generating credits during a phase-in of new standards, a manufacturer may elect to

split a test group into two subgroups: one which uses credits and one which generates credits. The manufacturer must indicate in the application for certification that the test group is to be split, and may assign the numbers and configurations of vehicles within the respective subfamilies at any time prior to the submission of the end-of-year report described in § 86.1817-05 (i)(3). Manufacturers certifying a split test group may label all of the vehicles within that test group with the same FELs: either with a NO_x FEL and an NMHC FEL, or with a single NO_x+NMHC FEL. The FEL(s) on the label will apply for all SEA or other compliance testing.

(7) Vehicles meeting all of the applicable standards of § 86.1816-08 prior to model year 2008 may generate NMHC credits for use by 2008 or later test groups. Credits are calculated according to § 86.1817-05(c), except that the applicable FEL cap listed in § 86.1816-08(a)(1)(ii)(B) or (2)(ii)(B) applies instead of “Std” (the applicable standard).

[66 FR 5192, Jan. 18, 2001]

§ 86.1818-12 Greenhouse gas emission standards for light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles.

(a) *Applicability.* This section contains standards and other regulations applicable to the emission of the air pollutant defined as the aggregate group of six greenhouse gases: Carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. This section applies to 2012 and later model year LDVs, LDTs and MDPVs, including multi-fuel vehicles, vehicles fueled with alternative fuels, hybrid electric vehicles, plug-in hybrid electric vehicles, electric vehicles, and fuel cell vehicles. Unless otherwise specified, multi-fuel vehicles must comply with all requirements established for each consumed fuel. The provisions of this section, except paragraph (c), also apply to clean alternative fuel conversions as defined in 40 CFR 85.502, of all model year light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles. Manufacturers that qualify as a small business according

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to the requirements of § 86.1801–12(j) are exempt from the emission standards in this section. Manufacturers that have submitted a declaration for a model year according to the requirements of § 86.1801–12(k) for which approval has been granted by the Administrator are conditionally exempt from the emission standards in paragraphs (c) through (e) of this section for the approved model year.

(b) *Definitions.* For the purposes of this section, the following definitions shall apply:

(1) *Passenger automobile* means a motor vehicle that is a passenger automobile as that term is defined in 49 CFR 523.4.

(2) *Light truck* means a motor vehicle that is a non-passenger automobile as that term is defined in 49 CFR 523.5.

(c) *Fleet average CO₂ standards for passenger automobiles and light trucks.* (1) For a given individual model year's production of passenger automobiles and light trucks, manufacturers must comply with a fleet average CO₂ standard calculated according to the provisions of this paragraph (c). Manufacturers must calculate separate fleet average CO₂ standards for their passenger automobile and light truck fleets, as those terms are defined in this section. Each manufacturer's fleet average CO₂ standards determined in this paragraph (c) shall be expressed in whole grams per mile, in the model year specified as applicable. Manufacturers eligible for and choosing to participate in the Temporary Leadtime Allowance Alternative Standards for qualifying manufacturers specified in paragraph (e) of this section shall not include vehicles subject to the Temporary Leadtime Allowance Alternative Standards in the calculations of their primary passenger automobile or light truck standards determined in this paragraph (c). Manufacturers shall demonstrate compliance with the applicable standards according to the provisions of § 86.1865–12.

(2) *Passenger automobiles—(i) Calculation of CO₂ target values for passenger automobiles.* A CO₂ target value shall be determined for each passenger automobile as follows:

(A) For passenger automobiles with a footprint of less than or equal to 41 square feet, the gram/mile CO₂ target

value shall be selected for the appropriate model year from the following table:

Model year	CO ₂ target value (grams/mile)
2012	244.0
2013	237.0
2014	228.0
2015	217.0
2016 and later	206.0

(B) For passenger automobiles with a footprint of greater than 56 square feet, the gram/mile CO₂ target value shall be selected for the appropriate model year from the following table:

Model year	CO ₂ target value (grams/mile)
2012	315.0
2013	307.0
2014	299.0
2015	288.0
2016 and later	277.0

(C) For passenger automobiles with a footprint that is greater than 41 square feet and less than or equal to 56 square feet, the gram/mile CO₂ target value shall be calculated using the following equation and rounded to the nearest 0.1 grams/mile:

$$\text{Target CO}_2 = [4.72 \times f] + b$$

Where:

f is the vehicle footprint, as defined in § 86.1803; and

b is selected from the following table for the appropriate model year:

Model year	<i>b</i>
2012	50.5
2013	43.3
2014	34.8
2015	23.4
2016 and later	12.7

(ii) *Calculation of the fleet average CO₂ standard for passenger automobiles.* In each model year manufacturers must comply with the CO₂ exhaust emission standard for their passenger automobile fleet, calculated for that model year as follows:

(A) A CO₂ target value shall be determined according to paragraph (c)(2)(i) of this section for each unique combination of model type and footprint value.

(B) Each CO₂ target value, determined for each unique combination of

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model type and footprint value, shall be multiplied by the total production of that model type/footprint combination for the appropriate model year.

(C) The resulting products shall be summed, and that sum shall be divided by the total production of passenger automobiles in that model year. The result shall be rounded to the nearest whole gram per mile. This result shall be the applicable fleet average CO₂ standard for the manufacturer's passenger automobile fleet.

(3) *Light trucks*—(i) *Calculation of CO₂ target values for light trucks.* A CO₂ target value shall be determined for each light truck as follows:

(A) For light trucks with a footprint of less than or equal to 41 square feet, the gram/mile CO₂ target value shall be selected for the appropriate model year from the following table:

Model year	CO ₂ target value (grams/mile)
2012	294.0
2013	284.0
2014	275.0
2015	261.0
2016 and later	247.0

(B) For light trucks with a footprint of greater than 66 square feet, the gram/mile CO₂ target value shall be selected for the appropriate model year from the following table:

Model year	CO ₂ target value (grams/mile)
2012	395.0
2013	385.0
2014	376.0
2015	362.0
2016 and later	348.0

(C) For light trucks with a footprint that is greater than 41 square feet and less than or equal to 66 square feet, the gram/mile CO₂ target value shall be calculated using the following equation and rounded to the nearest 0.1 grams/mile:

$$\text{Target CO}_2 = (4.04 \times f) + b$$

Where:

f is the footprint, as defined in § 86.1803; and *b* is selected from the following table for the appropriate model year:

Model year	b
2012	128.6

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Model year	b
2013	118.7
2014	109.4
2015	95.1
2016 and later	81.1

(ii) *Calculation of fleet average CO₂ standards for light trucks.* In each model year manufacturers must comply with the CO₂ exhaust emission standard for their light truck fleet, calculated for that model year as follows:

(A) A CO₂ target value shall be determined according to paragraph (c)(3)(i) of this section for each unique combination of model type and footprint value.

(B) Each CO₂ target value, which represents a unique combination of model type and footprint value, shall be multiplied by the total production of that model type/footprint combination for the appropriate model year.

(C) The resulting products shall be summed, and that sum shall be divided by the total production of light trucks in that model year. The result shall be rounded to the nearest whole gram per mile. This result shall be the applicable fleet average CO₂ standard for the manufacturer's light truck fleet.

(d) *In-use CO₂ exhaust emission standards.* The in-use exhaust CO₂ emission standard shall be the combined city/highway carbon-related exhaust emission value calculated for the appropriate vehicle carline/subconfiguration according to the provisions of § 600.113-08(g)(4) of this chapter multiplied by 1.1 and rounded to the nearest whole gram per mile. For in-use vehicle carlines/subconfigurations for which a combined city/highway carbon-related exhaust emission value was not determined under § 600.113(g)(4) of this chapter, the in-use exhaust CO₂ emission standard shall be the combined city/highway carbon-related exhaust emission value calculated according to the provisions of § 600.208-12 of this chapter for the vehicle model type (except that total model year production data shall be used instead of sales projections) multiplied by 1.1 and rounded to the nearest whole gram per mile. For vehicles that are capable of operating on multiple fuels, including but not limited to alcohol dual fuel, natural gas dual fuel and plug-in hybrid electric

vehicles, a separate in-use standard shall be determined for each fuel that the vehicle is capable of operating on. These standards apply to in-use testing performed by the manufacturer pursuant to regulations at §§ 86.1845–04 and 86.1846–01 and to in-use testing performed by EPA.

(e) *Temporary Lead Time Allowance Alternative Standards.* (1) The interim fleet average CO₂ standards in this paragraph (e) are optionally applicable to each qualifying manufacturer, where the terms “sales” or “sold” as used in this paragraph (e) means vehicles produced and delivered for sale (or sold) in the states and territories of the United States.

(i) A qualifying manufacturer is a manufacturer with sales of 2009 model year combined passenger automobiles and light trucks of greater than zero and less than 400,000 vehicles.

(A) If a manufacturer sold less than 400,000 but more than zero 2009 model year combined passenger automobiles and light trucks while under the control of another manufacturer, where those 2009 model year passenger automobiles and light trucks bore the brand of the producing manufacturer, and where the producing manufacturer became independent no later than December 31, 2010, the producing manufacturer is a qualifying manufacturer.

(B) In the case where two or more qualifying manufacturers combine as the result of merger or the purchase of 50 percent or more of one or more companies by another company, and if the combined 2009 model year sales of the merged or combined companies is less than 400,000 but more than zero (combined passenger automobiles and light trucks), the corporate entity formed by the combination of two or more qualifying manufacturers shall continue to be a qualifying manufacturer. The total number of vehicles that the corporate entity is allowed to include under the Temporary Leadtime Allowance Alternative Standards shall be determined by paragraph (e)(2) or (e)(3) of this section where sales is the total combined 2009 model year sales of all of the merged or combined companies. Vehicles sold by the companies that combined by merger/acquisition to form the corporate entity that were

subject to the Temporary Leadtime Allowance Alternative Standards in paragraph (e)(4) of this section prior to the merger/acquisition shall be combined to determine the remaining number of vehicles that the corporate entity may include under the Temporary Leadtime Allowance Alternative Standards in this paragraph (e).

(C) In the case where two or more manufacturers combine as the result of merger or the purchase of 50 percent or more of one or more companies by another company, and if the combined 2009 model year sales of the merged or combined companies is equal to or greater than 400,000 (combined passenger automobiles and light trucks), the new corporate entity formed by the combination of two or more manufacturers is not a qualifying manufacturer. Such a manufacturer shall meet the emission standards in paragraph (c) of this section beginning with the model year that is numerically two years greater than the calendar year in which the merger/acquisition(s) took place.

(ii) For the purposes of making the determination in paragraph (e)(1)(i) of this section, “manufacturer” shall mean that term as defined at 49 CFR 531.4 and as that definition was applied to the 2009 model year for the purpose of determining compliance with the 2009 corporate average fuel economy standards at 49 CFR parts 531 and 533.

(iii) A qualifying manufacturer may not use these Temporary Leadtime Allowance Alternative Standards until they have used all available banked credits and/or credits available for transfer accrued under § 86.1865–12(k). A qualifying manufacturer with a net positive credit balance calculated under § 86.1865–12(k) in any model year after considering all available credits either generated, carried forward from a prior model year, transferred from other averaging sets, or obtained from other manufacturers, may not use these Temporary Leadtime Allowance Alternative Standards in such model year.

(2) Qualifying manufacturers may select any combination of 2012 through 2015 model year passenger automobiles and/or light trucks to include under the Temporary Leadtime Allowance

Alternative Standards determined in this paragraph (e) up to a cumulative total of 100,000 vehicles. Vehicles selected to comply with these standards shall not be included in the calculations of the manufacturer's fleet average standards under paragraph (c) of this section.

(3) Qualifying manufacturers with sales of 2009 model year combined passenger automobiles and light trucks in the United States of greater than zero and less than 50,000 vehicles may select any combination of 2012 through 2015 model year passenger automobiles and/or light trucks to include under the Temporary Leadtime Allowance Alternative Standards determined in this paragraph (e) up to a cumulative total of 200,000 vehicles, and additionally may select up to 50,000 2016 model year vehicles to include under the Temporary Leadtime Allowance Alternative Standards determined in this paragraph (e). To be eligible for the provisions of this paragraph (e)(3) qualifying manufacturers must provide annual documentation of good-faith efforts made by the manufacturer to purchase credits from other manufacturers. Without such documentation, the manufacturer may use the Temporary Leadtime Allowance Alternative Standards according to the provisions of paragraph (e)(2) of this section, and the provisions of this paragraph (e)(3) shall not apply. Vehicles selected to comply with these standards shall not be included in the calculations of the manufacturer's fleet average standards under paragraph (c) of this section.

(4) To calculate the applicable Temporary Leadtime Allowance Alternative Standards, qualifying manufacturers shall determine the fleet average standard separately for the passenger automobiles and light trucks selected by the manufacturer to be subject to the Temporary Leadtime Allowance Alternative Standards, subject to the limitations expressed in paragraphs (e)(1) through (3) of this section.

(i) The Temporary Leadtime Allowance Alternative Standard applicable to qualified passenger automobiles as defined in §600.002-08 of this chapter shall be the standard calculated using the provisions of paragraph (c)(2)(ii) of this section for the appropriate model

year multiplied by 1.25 and rounded to the nearest whole gram per mile. For the purposes of applying paragraph (c)(2)(ii) of this section to determine the standard, the passenger automobile fleet shall be limited to those passenger automobiles subject to the Temporary Leadtime Allowance Alternative Standard.

(ii) The Temporary Leadtime Allowance Alternative Standard applicable to qualified light trucks (*i.e.* non-passenger automobiles as defined in §600.002-08 of this chapter) shall be the standard calculated using the provisions of paragraph (c)(3)(ii) of this section for the appropriate model year multiplied by 1.25 and rounded to the nearest whole gram per mile. For the purposes of applying paragraph (c)(3)(ii) of this section to determine the standard, the light truck fleet shall be limited to those light trucks subject to the Temporary Leadtime Allowance Alternative Standard.

(5) Manufacturers choosing to optionally apply these standards are subject to the restrictions on credit banking and trading specified in §86.1865-12.

(f) *Nitrous oxide (N₂O) and methane (CH₄) exhaust emission standards for passenger automobiles and light trucks.* Each manufacturer's fleet of combined passenger automobile and light trucks must comply with N₂O and CH₄ standards using either the provisions of paragraph (f)(1) of this section or the provisions of paragraph (f)(2) of this section. The manufacturer may not use the provisions of both paragraphs (f)(1) and (f)(2) of this section in a model year. For example, a manufacturer may not use the provisions of paragraph (f)(1) of this section for their passenger automobile fleet and the provisions of paragraph (f)(2) for their light truck fleet in the same model year.

(1) *Standards applicable to each test group.* (i) Exhaust emissions of nitrous oxide (N₂O) shall not exceed 0.010 grams per mile at full useful life, as measured according to the Federal Test Procedure (FTP) described in subpart B of this part.

(ii) Exhaust emissions of methane (CH₄) shall not exceed 0.030 grams per mile at full useful life, as measured according to the Federal Test Procedure

(FTP) described in subpart B of this part.

(2) *Including N₂O and CH₄ in fleet averaging program.* Manufacturers may elect to not meet the emission standards in paragraph (f)(1) of this section. Manufacturers making this election shall include N₂O and CH₄ emissions in the determination of their fleet average carbon-related exhaust emissions, as calculated in subpart F of part 600 of this chapter. Manufacturers using this option must include both N₂O and CH₄ full useful life values in the fleet average calculations for passenger automobiles and light trucks. Use of this option will account for N₂O and CH₄ emissions within the carbon-related exhaust emission value determined for each model type according to the provisions part 600 of this chapter. This option requires the determination of full useful life emission values for both the Federal Test Procedure and the Highway Fuel Economy Test.

[75 FR 25686, May 7, 2010, as amended at 76 FR 19874, Apr. 8, 2011]

§ 86.1819 [Reserved]

§ 86.1820-01 Durability group determination.

This section applies to the grouping of vehicles into durability groups. Manufacturers shall divide their product line into durability groups based on the following criteria:

(a) The vehicles covered by a certification application shall be divided into groups of vehicles which are expected to have similar emission deterioration and emission component durability characteristics throughout their useful life. Manufacturers shall use good engineering judgment in dividing their vehicles into durability groups. Such groups of vehicles are defined as durability groups.

(b) To be included in the same durability group, vehicles must be identical in all the respects listed in paragraphs (1) through (7) of this section:

(1) Combustion cycle (e.g., two stroke, four stroke, Otto cycle, diesel cycle).

(2) Engine type (e.g., piston, rotary, turbine, air cooled versus water cooled).

(3) Fuel used (e.g., gasoline, diesel, methanol, ethanol, CNG, LPG, flexible fuels).

(4) Basic fuel metering system (e.g., throttle body injection, port injection (including central port injection), carburetor, CNG mixer unit).

(5) Catalyst construction (for example, beads or monolith).

(6) Precious metal composition of the catalyst by the type of principal active material(s) used (e.g., platinum based oxidation catalyst, palladium based oxidation catalyst, platinum and rhodium three-way catalyst, palladium and rhodium three way catalyst, platinum and palladium and rhodium three way catalyst).

(7) The manufacturer must choose one of the following two criteria:

(i) Grouping statistic:

(A) Vehicles are grouped based upon the value of the grouping statistic determined using the following equation:

$$GS = [(Cat\ Vol)/(Disp)] \times Loading\ Rate$$

Where:

GS = Grouping Statistic used to evaluate the range of precious metal loading rates and relative sizing of the catalysts compared to the engine displacement that are allowable within a durability group. The grouping statistic shall be rounded to a tenth of a gram/liter, in accordance with the Rounding-Off Method specified in ASTM E29-93a, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications (incorporated by reference, see § 86.1).

Cat Vol = Total volume of the catalyst(s) in liters.

Disp = Displacement of the engine in liters.
Loading rate = The mass of total precious metal(s) in the catalyst (or the total mass of all precious metal(s) of all the catalysts if the vehicle is equipped with multiple catalysts) in grams divided by the total volume of the catalyst(s) in liters.

(B) Engine-emission control system combinations which have a grouping statistic which is either less than 25 percent of the largest grouping statistic value, or less than 0.2 g/liter (whichever allows the greater coverage of the durability group) shall be grouped into the same durability group.

(ii) The manufacturer may elect to use another procedure which results in at least as many durability groups as required using criteria in paragraph